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REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRADE
AND INDUSTRY

Hiermee word gesertifiseer dat
This is to certify that

the documents annexed hereto are true copies of:

Application forms P.1 and P.3, provisional specification and drawings of South African Patent Application No. 99/1940 as originally filed in the Republic of South Africa on 10 March 1999 in the name of PLASTRIM INVESTMENTS CC for an invention entitled: "AN ELONGATE PLASTIC ARTICLE".

1c971 U.S. PTO
09/938331



Geteken te
Signed at

PRETORIA

in die Republiek van Suid-Afrika, hierdie
in the Republic of South Africa, this

27 dag van
day of

July 2001

Registrateur van Patente
Registrar of Patents

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978
APPLICATION FOR A PATENT AND
ACKNOWLEDGEMENT OF RECEIPT
(Section 30(1) Regulation 22)

REPUBLIC OF SOUTH AFRICA
FORM P.1 REVENUE
(to be lodged in duplicate)

10.3.99

R 060.00

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

21 01 PATENT APPLICATION NO 991940 A&A REF V13271 AL

71 FULL NAME(S) OF APPLICANT(S)

PLASTRIM INVESTMENTS CC

ADDRESS(ES) OF APPLICANT(S)

100 St Georges Street, Newlands,
Gauteng, Republic of South Africa

54 TITLE OF INVENTION

"AN ELONGATE PLASTIC ARTICLE"

Only the items marked with an "X" in the blocks below are applicable.

☐ THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. The earliest priority claimed is

Country:

No:

Date:

☐ THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO 21 01

☐ THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON
APPLICATION NO 21 01

THIS APPLICATION IS ACCOMPANIED BY:

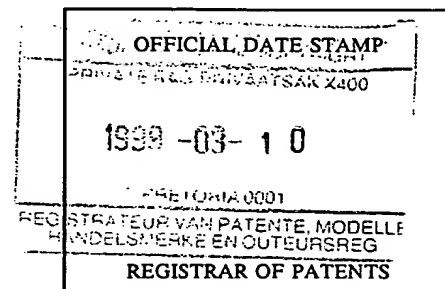
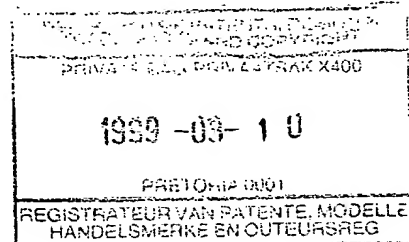
- ☒ A single copy of a provisional specification of 11 pages
☒ Drawings of 7 sheets
☐ Publication particulars and abstract (Form P.8 in duplicate) (for complete only)
☐ A copy of Figure of the drawings (if any) for the abstract (for complete only)
☒ An assignment of invention
☐ Certified priority document(s). (State quantity)
☐ Translation of the priority document(s)
☐ An assignment of priority rights
☐ A copy of Form P.2 and the specification of RSA Patent Application No 21 01
☒ Form P.2 in duplicate
☒ A declaration and power of attorney on Form P.3
☐ Request for ante-dating on Form P.4
☐ Request for classification on Form P.9
☐ Request for delay of acceptance on Form P.4
☐ Extra copy of informal drawings (for complete only)

74 ADDRESS FOR SERVICE: Adams & Adams, Pretoria

Dated this 10 day of March 1999

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APPLICANTS PATENT ATTORNEYS

The duplicate will be returned to the applicant's address for service as
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REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978
DECLARATION AND POWER OF ATTORNEY
(Section 30 - Regulation 8, 22(i)(c) and 33)

REPUBLIC OF SOUTH AFRICA
REVENUE FORM P.3

R 00100

PATENT APPLICATION NO		
21	01	991940

A&A Ref: V13271 AL

LODGING DATE
23 MAR 1999

FULL NAME(S) OF APPLICANT(S)	
71	PLASTRIM INVESTMENTS CC

FULL NAME(S) OF INVENTOR(S)	
72	ERHARD HÖNIG

EARLIEST PRIORITY CLAIMED		COUNTRY		NUMBER		DATE	
		33	ZA	31	NIL	32	NIL

NOTE: The country must be indicated by its International Abbreviation - see schedule 4 of the Regulations

TITLE OF INVENTION	
54	"AN ELONGATE PLASTIC ARTICLE"

REPUBLIC OF SOUTH AFRICA TRADE MARKS AND PATENTS PRIVATE BAG 1001 PRETORIA 0001 1999-03-10 REGISTRAR VAN PATENTE MOEDLE HANDELSMERKE EN OUTEURS-RE

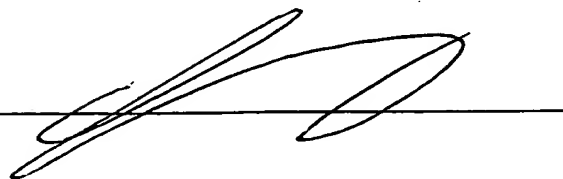
I/we Erhard Hönig

hereby declare that :-

1. I/we am/are the applicant(s) mentioned above;
- ** 2. I/we have been authorized by the applicant(s) to make this declaration and have knowledge of the facts herein stated in the capacity of Member of the applicant(s);
- *** 3. the inventor(s) of the abovementioned invention is/are the person(s) named above and the applicant(s) has/have acquired the right to apply by virtue of an assignment from the inventor(s);
4. to the best of my/our knowledge and belief, if a patent is granted on the application, there will be no lawful ground for the revocation of the patent;
- **** 5. ~~this is a convention application and the earliest application from which priority is claimed as set out above is the first application in a convention country in respect of the invention claimed in any of the claims; and~~
6. the partners and qualified staff of the firm of ADAMS & ADAMS, patent attorneys, are authorised, jointly and severally, with powers of substitution and revocation, to represent the applicant(s) in this application and to be the address for service of the applicant(s) while the application is pending and after a patent has been granted on the application.

SIGNED THIS 9th DAY OF MARCH

1999



(no legalization necessary)

- * In the case of application in the name of a company, partnership or firm, give full names of signatory/signatories, delete paragraph 1, and enter capacity of each signatory in paragraph 2.
- ** If the applicant is a natural person, delete paragraph 2.
- *** If the right to apply is not by virtue of an assignment from the inventor(s), delete "an assignment from the inventor(s)" and give details of acquisition of right.
- **** For non-convention applications, delete paragraph 5.

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FORM P6

REPUBLIC OF SOUTH AFRICA
Patents Act, 1978

PROVISIONAL SPECIFICATION

(Section 30 (1) - Regulation 27)

21	01	OFFICIAL APPLICATION NO
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991.940

22	LODGING DATE
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10 March 1999

71	FULL NAME(S) OF APPLICANT(S)
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PLASTRIM INVESTMENTS CC

72	FULL NAME(S) OF INVENTOR(S)
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ERHARD HÖNIG

54	TITLE OF INVENTION
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"AN ELONGATE PLASTIC ARTICLE"

THIS INVENTION relates to an apparatus for manufacturing an elongate plastic article, a method of manufacturing the article, and the article when manufactured by means of the apparatus or by the method.

According to the invention there is provided an apparatus for manufacturing an elongate plastic article which includes

an extrusion means for extruding a feedstock strip of a synthetic plastics material; and

at least one rotatable forming element for forming the feedstock strip into a formed strip with a desired profile.

Further according to the invention there is provided a method of manufacturing an elongate plastic article, which includes

extruding a feedstock strip of a synthetic plastics material; and

forming the extruded feedstock strip into a formed strip with a desired profile by means of at least one rotatable forming element.

The, or each, forming element may be wheel-like or roller-like having forming formations at its rim. For convenience, such a forming element is hereinafter referred to as a "roller". It will thus be appreciated by those skilled in the art that the or each roller may have a recessed rim in which the forming formations are located.

The invention extends still further to an elongate plastic article which has been manufactured by means of the apparatus or by the method of the invention.

The plastic may be a thermoplastic material and may, for example, be PVC, polystyrene, polyurethane or any other suitable thermoplastic synthetic plastics material.

A pair of rollers may be used which, between them, define the profile.

It will thus be appreciated that the profile of the extruded feedstock strip is, to a large extent, irrelevant, and the desired profile is provided by the feedstock strip being squeezed by the roller, or between the pair of rollers. The profile of the formed article is not determined by the head or aperture of the extrusion means.

The forming formations may include projections and recesses to provide the surface of the rolled, profiled strip with ornamentation or a pattern as well as the profile.

The feedstock strip may be extruded onto a substrate, the feedstock strip then being squeezed between the substrate and the roller or an upper, forming one of a pair of rollers. The substrate may be rigid or flexible, so long as it is able to support and carry the feedstock strip.

A region of the substrate onto which the formed strip is to be bonded may

be coated with a suitable adhesive or bonding layer.

The formed strip may be narrower than the substrate, so that the formed strip is applied onto a part of the substrate. Instead, the formed strip may be wider than the substrate, so that it is applied over the substrate.

The substrate may have a securing formation by means of which the elongate article may be secured to a body or surface. For example, the substrate may have a "T"-section, with the leg thereof having ribs or teeth to secure the leg in a groove in the surface or body.

The substrate may be supplied from a supply thereof, the substrate having been formed in a previous operation. Instead, the substrate may be formed in the same operation, by means of an extrusion station, with the extruded substrate being given sufficient time to harden sufficiently to carry and support the feedstock strip and not be deformed by the roller or the pair of rollers.

If only one roller is used, it may be freely rotatable or it may be driven. Similarly, if a pair of rollers is used, both may be freely rotatable, one may be freely rotatable and the other driven, or both may be driven. If they are both driven, then they are preferably driven at suitable rotational speeds to ensure the same linear perimetral speed. Thus, they may both have the same effective external diameter and be driven at the same rotational speed.

A surface ornamental layer may also be applied onto an upper surface of the formed strip. Conveniently, such an ornamental layer may be provided by a foil which is passed between the strip and the, or the forming, roller. The foil may be applied onto or over the feedstock strip, ie onto only a part of the formed strip; across the entire upper surface of the formed strip; or over the entire upper surface of the formed strip and part or all of adjacent surfaces of the substrate. The foil may be carried on a carrier which is removed downstream of the, or the forming, roller.

It will further be appreciated by those skilled in the art that the cross sectional area of the extruded feedstock strip of feedstock material may be substantially the same as that of the formed strip. However, the extruded feedstock strip may have slightly more material than that of the desired profile, so that there is a small ribbon on either side of the formed strip. The apparatus may then have a stripping station to remove the ribbons.

The elongate article may be intended to be used for a decorative or ornamental purpose or for a structural purpose such as a picture frame. However, the manner in which the elongate article is used, or its intended purpose is not hereby limited.

The invention is now described, by way of examples with reference to the accompanying drawings, in which:-

Figure 1 shows schematically a first embodiment of an apparatus in accordance with the invention for manufacturing an elongate plastic article;

Figure 2 shows schematically an elongate article manufactured by means of the apparatus of Figure 1, which is a first decorative article, with part removed to illustrate the construction better;

Figure 3 shows schematically a side view of a pair of rollers forming part of the apparatus of Figure 1 and how a substrate and a feedstock strip interact therewith;

Figure 4 shows schematically a second embodiment of an apparatus in accordance with the invention;

Figure 5 shows a sectioned end view of a second decorative strip manufactured by means of the apparatus and method of the invention;

Figure 6 shows a sectioned end view of a further decorative strip manufactured by means of the apparatus and method of the invention;

Figure 7 shows an end portion of a plank-like article manufactured by means of the apparatus and method, with part removed to illustrate the construction better, which is intended to be used as a picture frame; and

Figure 8 shows schematically a side view of a roller forming part of the apparatus used to manufacture the plank-like article shown in Figure 7 and how the substrate and the extruded feedstock strip interact therewith.

Referring to Figure 1, an apparatus for manufacturing an elongate plastic article is designated generally by reference numeral 10. The elongate article 12 is shown in Figure 2. The apparatus 10 has a first extruder 14 which extrudes a substrate 16 having a "T"-like cross section. The profile of the substrate 16 is shown more clearly in Figure 2 from which it will be seen that the substrate 16 has a bar 18 with a leg 20. The bar 18 has a convex curved upper surface 22 and the leg 20 has securing ribs 24. The substrate 16 is integrally extruded by the first extruder 14 which has an extrusion head (not shown) with a suitably shaped aperture. The substrate 16 is of PVC and is flexible so that it can be bent and curved to have a suitable spatial configuration.

The extruded substrate 16 coming out of the first extruder 14 passes through a first water bath 26 where it is cooled to have mechanical strength.

Downstream of the first water bath 26 is an adhesive applicator 28 which applies a layer or coating of adhesive to the convex upper surface 22 of the bar 18.

The apparatus 10 further includes a second extruder 30. This second extruder 30 extrudes a feedstock strip 32 that has a circular cross section as is

more clearly shown in Figure 3. The feedstock strip 32 is also of PVC.

Immediately downstream of the second extruder 30 and close enough that the feedstock strip 32 does not cool much and remains sufficiently hot to be moulded, there is a moulding station 34.

The moulding station 34 has a paired upper roller 36 and lower roller 38. The upper roller 36 has a concave rim 40 as is seen more clearly in Figure 3. As will be appreciated from what is said below, the concave rim 40 defines a moulding cavity together with the substrate 16 and the lower roller 38. Thus, the upper roller 36 is profiled to mould the feedstock strip 32 to have the desired profile. As seen in Figures 2 and 3, the feedstock strip 32 is moulded over the bar 18 of the substrate 16 into a formed strip 42 which has a central lower recess in which the bar 18 seats, with planar lower surfaces 44 on either side thereof. The formed strip 42 also has a central longitudinally extending convex upper region 46 with a longitudinally convex edge section 48 on either side. The central region 46 has a repeating pattern of protrusions 50 and the edge sections 48 have corrugations 52.

As is seen in Figure 3, the concave rim 40 is complementarily shaped to the upper surface of the formed strip 42.

It will further be seen in Figure 3 that the lower roller 38 has a groove 54 in its rim in which the leg 20 of the substrate 16 is received. The groove 54 is

narrower than the bar 18 and sufficiently deep so that the lower edge portions of the bar 18 seat on support surfaces 56 of the rim of the lower roller 38 that are cylindrical.

It will further be appreciated that the upper roller has fairly sharp edges 60, and the two rollers 36 and 38 are spaced so that there is a gap of about 0,2 mm between the edges 60 and the surfaces 56.

Thus, the substrate 16 is fed between the two rollers 36 and 38 to define with them a progressive moulding cavity as the rollers 36, 38 rotate and the substrate 16 passes between them. The feedstock strip 32 is fed onto the substrate 16 and supported thereby (in this embodiment) to be moulded into the formed strip 42 by the progressive moulding cavity.

The rollers 36, 38 are mounted to be rotatable about parallel axes 62 and 64 respectively, which are transverse to the direction of travel of the substrate 16. The rollers 36 and 38 have the same effective diameters and are driven together at the same speed.

It will be appreciated further that the feedstock strip 32 is drawn between the rollers 36 and 38 and is squeezed to have the desired profile as the rollers 36, 38 are rotated.

Those skilled in the art will appreciate that the substrate 16 is not essential

and the formed strip 42 could be formed without the substrate 16. The apparatus 10 would then not have the first extruder 14, the first water bath 26 and the applicator 28. The feedstock strip 32 would then be fed between the rollers 36 and 38 and the lower roller 38 would not have the groove 54.

Still further, it will be understood that the progressive moulding cavity has a cross sectional area and the feedstock strip 32 has a slightly larger cross sectional area so that there is sufficient material to fill the progressive moulding cavity and have a small excess. This small excess is then squeezed out between the two rollers 36 and 38 to provide edge ribbons 66. These are easily trimmed off and removed by a stripping station (not shown).

The formed strip 42 is bonded to the substrate 16, bonding being improved by the adhesive applied by the applicator 28.

The substrate 16 and formed strip 42 are passed through a second water bath 68 to provide the elongate article 12. The elongate article 12 passes through a take off station 70 and it is then coiled by means of a coiling machine (not shown).

Referring now to Figure 4, a second embodiment of an apparatus in accordance with the invention is designated generally by reference number 72. This second embodiment has the extruder 30, moulding station 34, water bath 68 and take off station 70. It does not have the first extruder 14, the first water bath

26 and the applicator 28. The substrate 16 is manufactured in a separate operation and is supplied from a coil 74 to the moulding station 34, between the rollers 36 and 38. A woodgrain ornamental foil 76 is also supplied from a coil 78 on top of the feedstock strip 32 between the feedstock 32 and the upper roller 36. The foil 76 is bonded by heat and pressure as it passes through the progressive moulding cavity onto the upper surface of the formed strip 42.

Referring now to Figure 5 a further flexible decorative elongate article 80 in accordance with the invention is shown. This article is similar to the article 12, except that the substrate 16 has a bar 18 that is wider than the formed strip 42, so that the progressive moulding cavity is defined by the substrate 16 and the upper roller 36.


A third embodiment of a flexible decorative article 82 is shown in Figure 6. This embodiment 82 is also similar to the embodiment 12, with the formed strip 42 being slightly wider than the bar 18.

A fourth embodiment 84 of a rigid structural elongate article is shown in Figure 7. This article 84 has a substrate 86 that is of wood which has been machined to have the profile shown. A portion of the upper surface thereof is coated with an adhesive layer 88 and the formed strip 42 bonded thereto.

The formed strip 42 is formed by means of a single roller 90, as shown in Figure 8. Thus, the substrate 86 is passed between a support surface 92 and the

roller 90 and a circular feedstock strip 94 issuing from an extruder such as the extruder 30 is fed onto the substrate 86 and moulded by the progressive cavity formed by the substrate 86 and the roller 90. The article 84 is intended for use as a picture frame or rail.

DATED THE 10th DAY OF MARCH 1999.

A handwritten signature in black ink, appearing to be 'A. Lewis', written over the printed name.

A. LEWIS

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APPLICANT'S PATENT ATTORNEYS

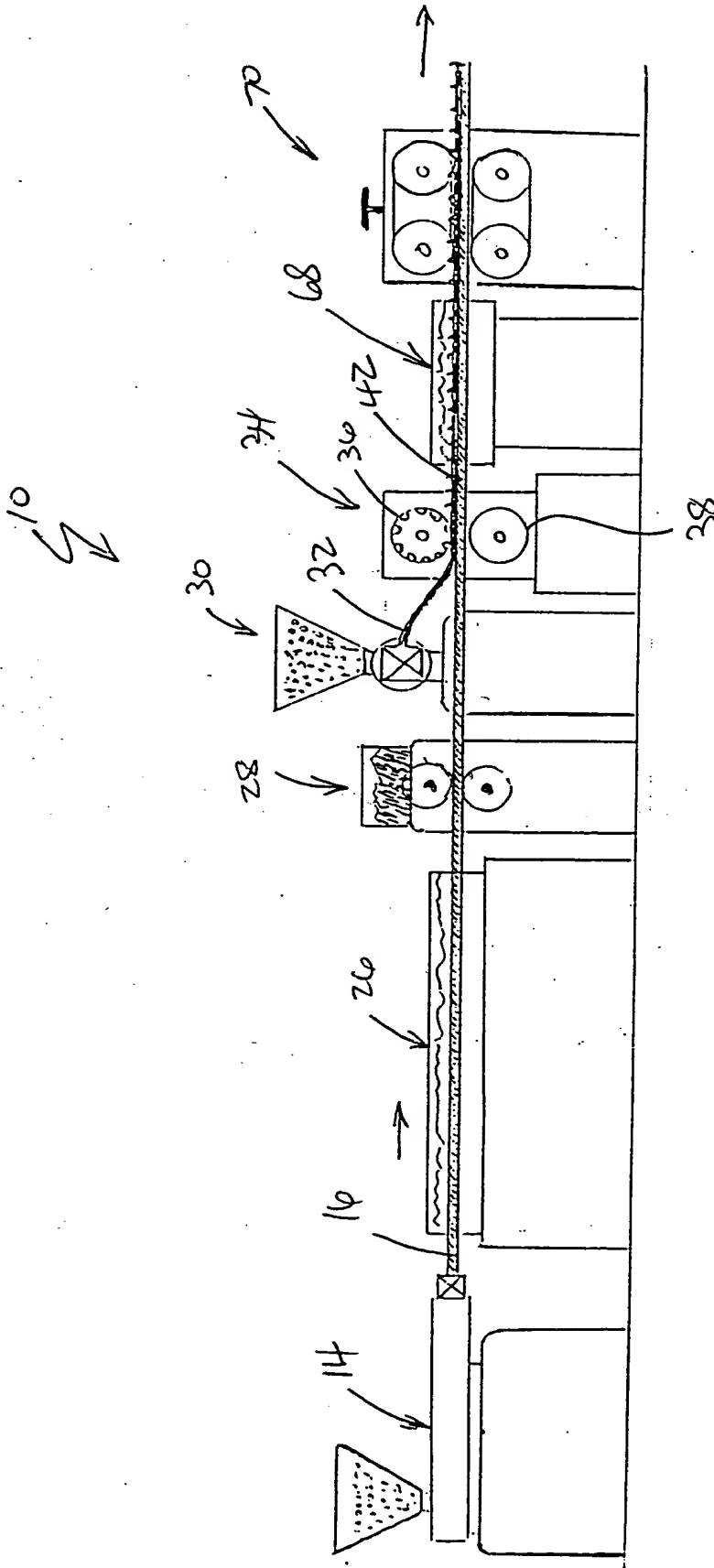
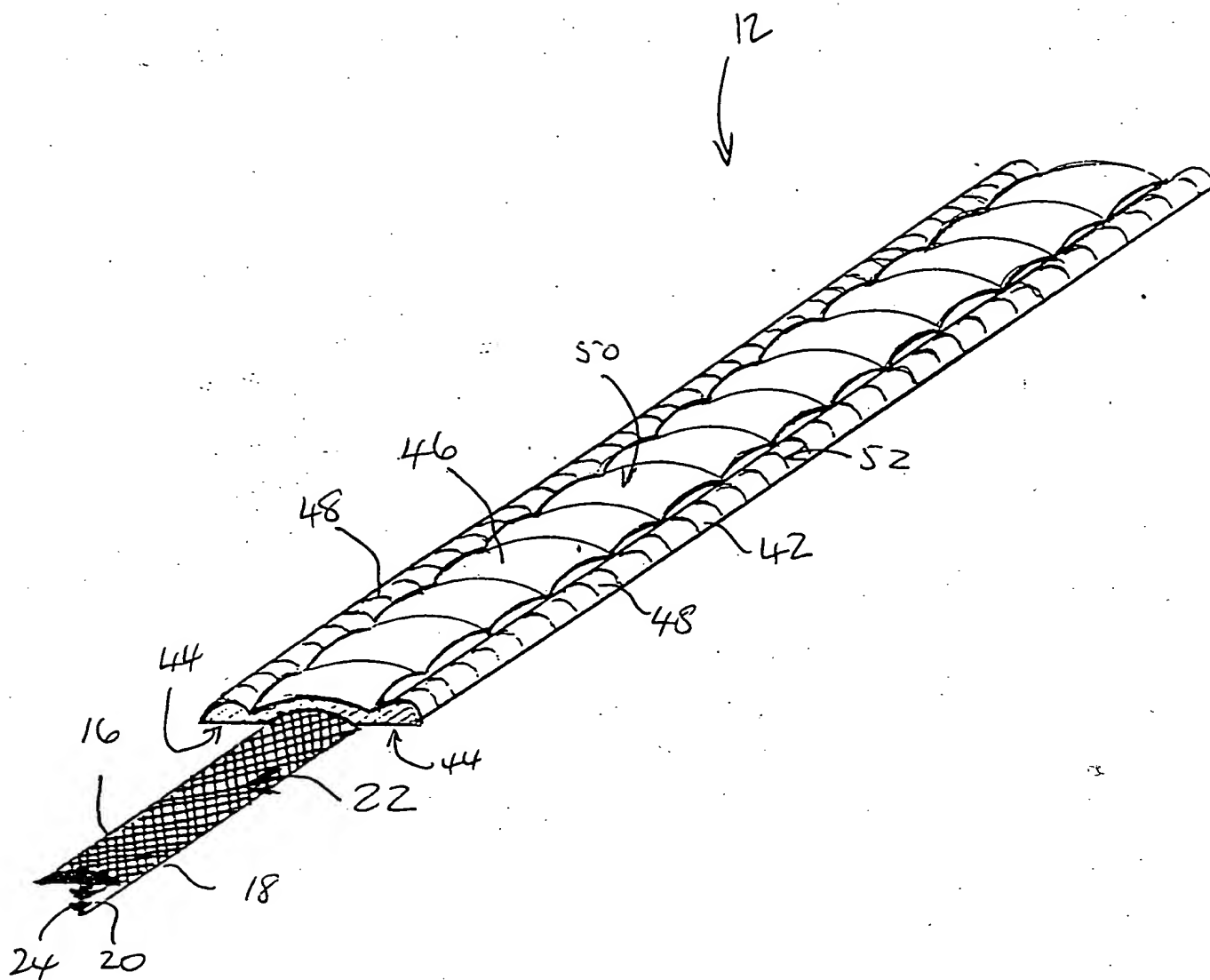



FIG 1

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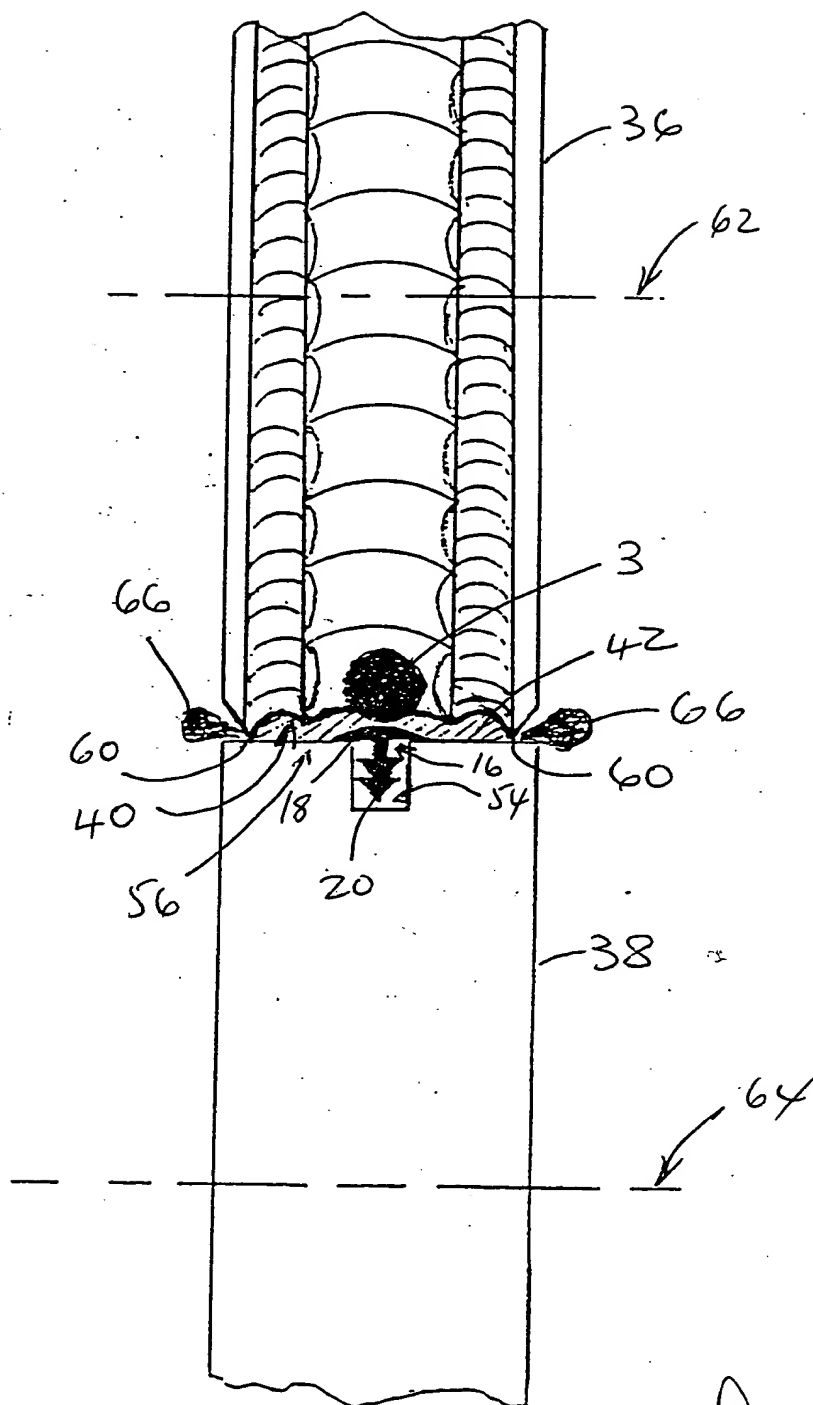


FIG. 3

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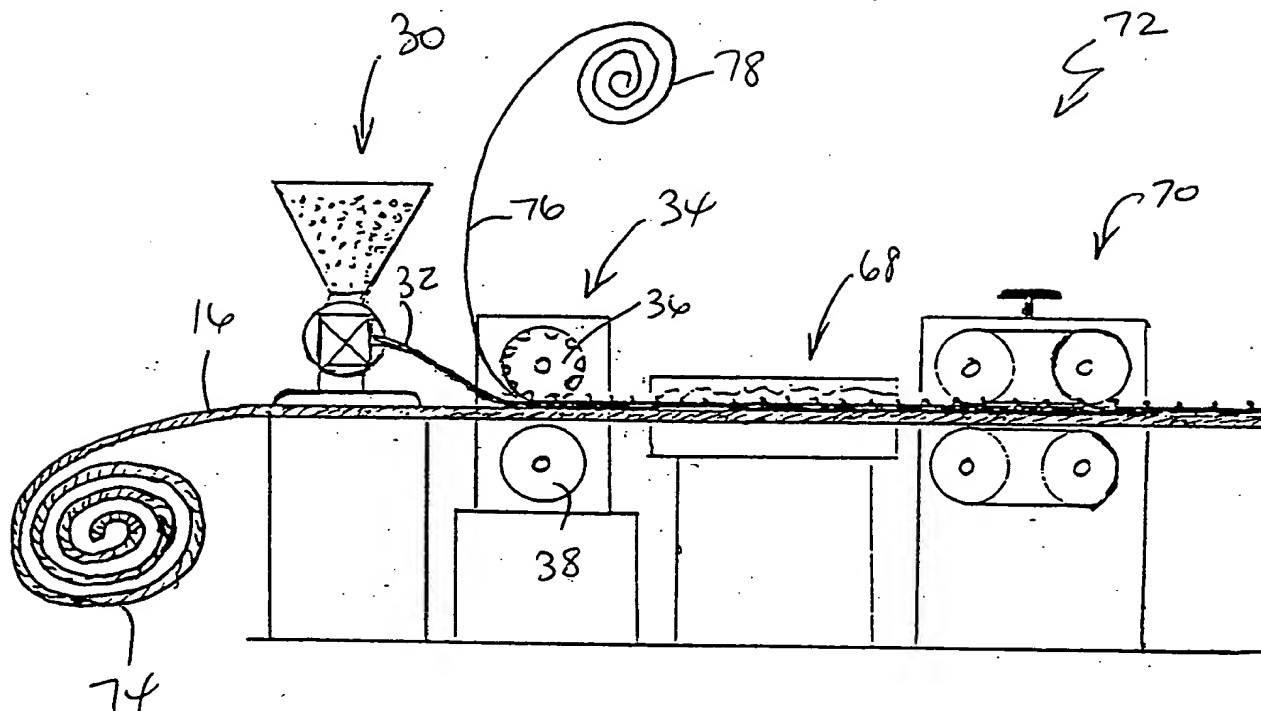


FIG 4

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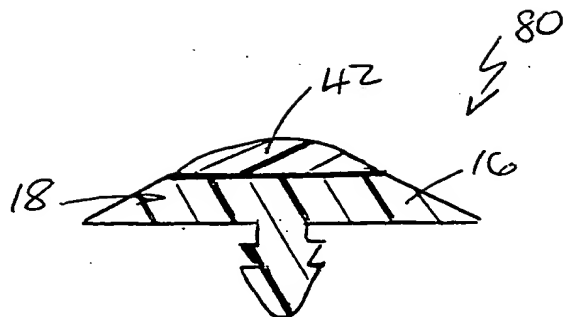


FIG. 5

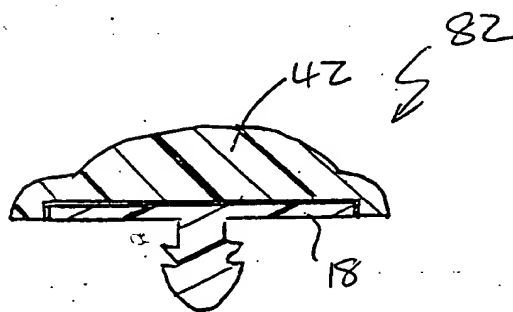


FIG. 6

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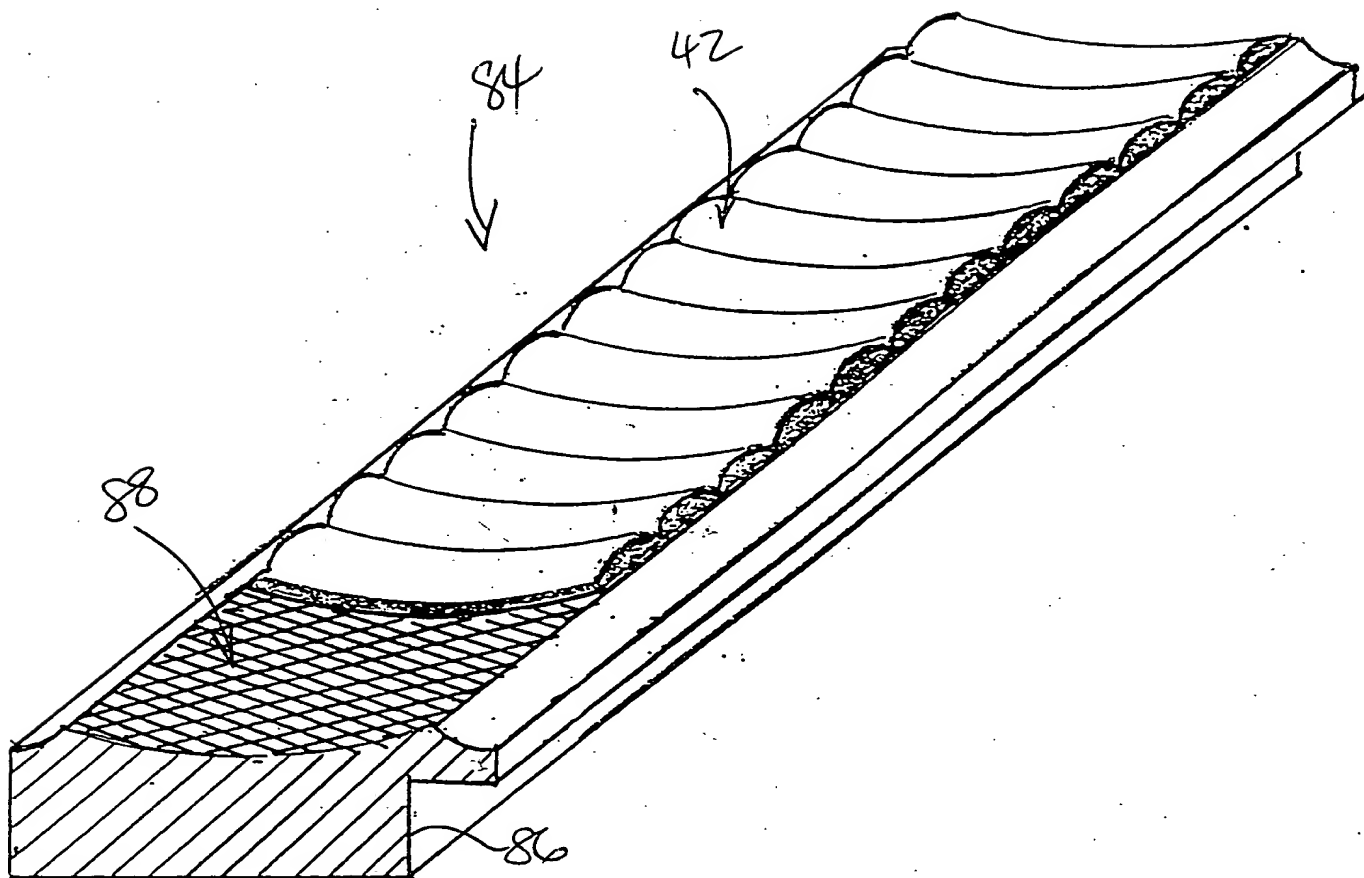


FIG. 7

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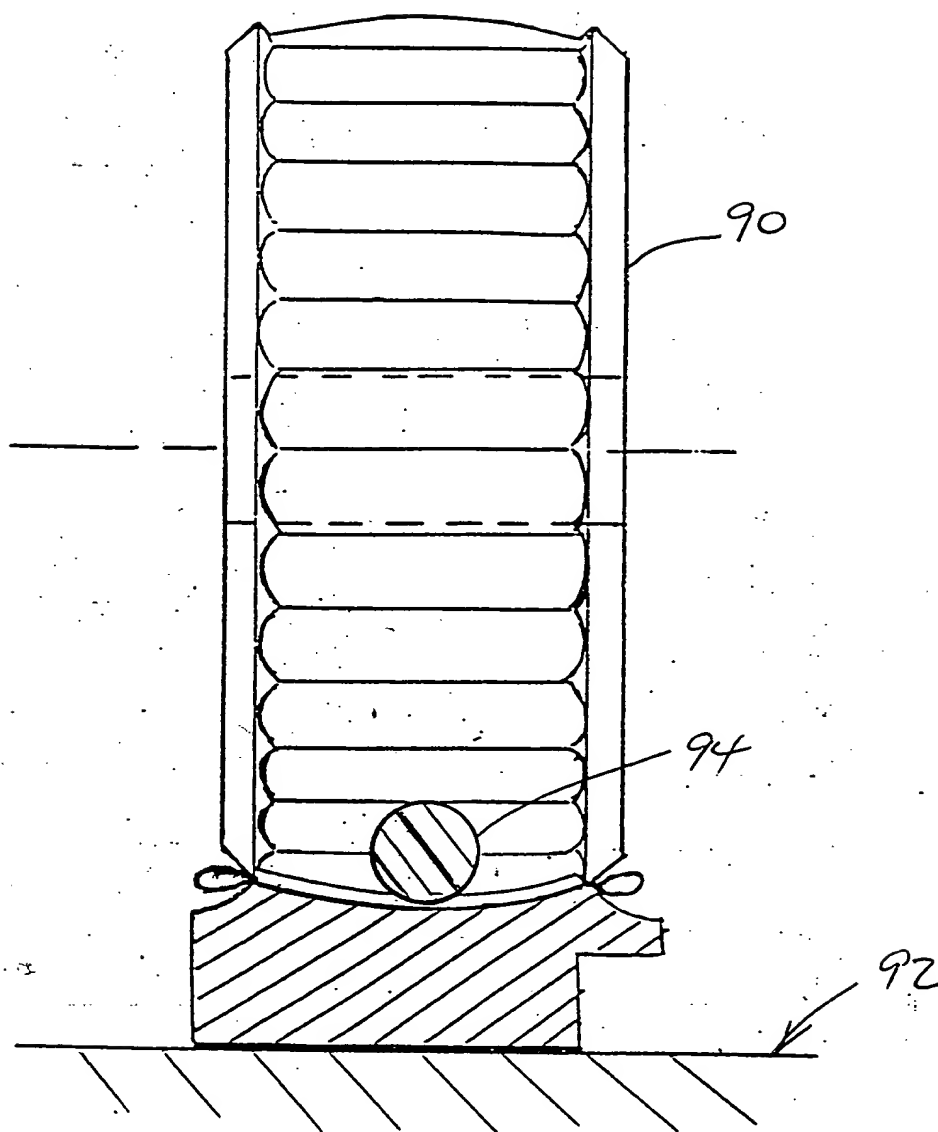


FIG. 8

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